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## STUDIES OF RHYTHM AND METER.

By NORMAN TRIPLETT AND EDMUND C. SANFORD.

(*From the Psychological Laboratory, Clark University.*)

- I—On the stanza forms of nursery rhymes.
- II—An experimental study of the rhythms of nursery rhymes.
- III—College yells.
- IV—A brief collection of common rhythms with words that have been fitted to them.

### I. ON THE STANZA FORMS OF NURSERY RHYMES.

In attempting to recall a forgotten phrase or stanza it is by no means uncommon to recapture the "sound" or "lilt" of it, while the words escape; we recall the form or plan of the phrase, but not the filling in. At other times, as in listening to a conversation indistinctly heard, *e. g.*, by telephone, we are able, from the familiar cadence of the sounds, few of which are distinct enough to be fully recognized, to reconstruct the phrases which we can hardly be said to hear. To such groups of related sounds and others similar, considered merely as sounds, we may give the name of auditory forms.

Auditory forms bear the same relation to the things of the auditory world—phrases of speech, city noises, cries of animals and the like—as the figures of bodies bear to the things of the visual and tactual worlds. An ivy leaf or the new moon is not more characteristic and easily recognizable in its visual form than the crowing of a cock or the hoof-beat of a galloping horse in its auditory form. Visual form means certain fixed associations of visual, tactual and kinæsthetic sensations; auditory form certain fixed associations of auditory and kinæsthetic sensations. In both cases the form pure and simple is the result of a certain degree of abstraction (not necessarily conscious); the color and material of a pebble are neglected when its roundness is considered, and in the same way the words and meaning of a phrase are neglected when its rhythm is regarded. Furthermore, as there are in the visual world objects of the most varied form, some irregular, like clods and rock masses, others with regularity of plan, like flowers and fruits, and finally, objects of human construction showing the regular geometrical figures, so there are in the auditory world forms of considerable irregularity, like those of prose speech, others of approximate regularity, like lines of poetry

and phrases of music, and still others of complete regularity, like the ticking of a clock or the artificially grouped sounds of the laboratory experiments on rhythm,—these last fairly comparable to the geometrical figures—the regular chronometrical figures as they might be called.

It is the purpose of the following studies to present certain observations and experiments with reference to auditory forms of the more regular sorts, and of this section and the next to consider the stanza forms or “metrical patterns” of nursery rhymes.

These rhymes offer a natural approach to the study of poetical rhythm and meter in general. They are in the highest degree rhythmical, almost everything else being sacrificed to that, and they are simple, as they must be to suit the tastes and comprehension of little children. They owe their origin, of course, to the natural responsiveness of children to rhythmic sounds and movements. Some are clearly motion songs. The regular movements used for lulling the child to sleep or those of marching have furnished a framework which has later been given a verbal covering, and rhythmic movements are still a frequent accompaniment of some of them. Others seem to have started in the mere repetition of a single word, as “Peter, Peter,” or a common phrase as “There was an old woman,” or “There was a little man.” The rhythm thus set was carried on as words offered and fancy suggested till a full stanza was formed, crude at first perhaps, but improving with time and as the rhyme passed from mouth to mouth. Still others have had a definite history and have entered nursery literature from popular verse at various times. Many have the irregularity of all natural and spontaneous products, and take liberties in the matter of accent and pronunciation that would hardly be tolerated in more formal verse, yet the difficulties thus introduced are not very serious. For present purposes they may be entirely neglected, for in the more familiar rhymes, at least, they affect the foot structure rather than the stanza forms.

The rhymes that have formed the basis of this study are the one hundred generally familiar ones collected by one of us in answer to a request addressed to a large number of persons for a list of ten rhymes each—if possible the first ten coming to mind.<sup>1</sup>

The most frequent stanza form in this list is that of four lines of four stresses each, for example,

Georgie, porgie, pudding and pie;  
Kissed the girls and made them cry.  
When the boys came out to play,  
Georgie porgie ran away.

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<sup>1</sup>Triplett: A Census of Nursery Rhymes, *Journal of Pedagogy*, April, 1901.

In nearly all cases the lines rhyme in couplets as in this example, showing the close relation of this stanza pattern to the simpler pattern of the couplet. The couplet is itself not uncommon, either standing alone or repeated as the stanza unit of longer rhymes, as for example,

Needles and pins, needles and pins!  
When a man marries, his trouble begins.

and

"Where are you going, my pretty maid?  
"I'm going a milking, sir," she said.

"May I go with you, my pretty maid?"  
"Yes, if you please, kind sir," she said, etc., etc.

The 4-stress line, especially in couplets, is very ancient in English poetry,<sup>1</sup> and is based on what appears to be a very natural grouping for sounds of moderate frequency.<sup>2</sup> The simplest possible rhythmic structure is undoubtedly the grouping of stresses by twos, and of 2-stress lines there are a few examples among the nursery rhymes,—for example,

One, two;  
Buckle my shoe.  
etc., etc.

The next stage, antedating (one may conjecture) any attempt at a 3-stress line, is the line of two twos, or the 4-stress line. These united in the simplest possible way gives the couplet, the fundamental pattern of this group, and a pair of couplets the most frequent stanza of the nursery rhymes. The stanza of four 4-stress lines, rhyming in couplets or otherwise is also a very common one in lyric poetry generally. In hymnology it occurs as the long meter stanza (iambic) and as the four line stanza of 7's (trochaic), both extremely common hymn stanzas.

Another numerous group is that in which the stanza consists of two 4-stress lines (the first and third) and two 3-stress lines (the second and fourth), or, as it might as properly be written in most cases, of a couplet of 7-stress lines or septenaries.<sup>3</sup> Of these there are two varieties, one in which the 4-stress lines are broken by internal rhyme, and one in which they are not. As an example of the first we may cite

<sup>1</sup> Cf. Schipper: *Grundriss der englischen Metrik*, Leipzig, 1895, pp. 108, 176.

<sup>2</sup> Cf. Bolton: *Rhythm*, *Amer. Jour. of Psy.*, VI, 1893-95, pp. 212, 216.

<sup>3</sup> No spatial arrangement of the parts of a stanza can give a parallel of the temporal arrangement presented to the ear, unless it be the placing of all the parts in a single line, with spacing to indicate the separation of the parts.

Mistress Mary, quite contrary,  
 How does your garden grow?  
 Silver bells and cockle shells  
 And pretty maids all in a row.

Of the second,

There was a man in our town,  
 And he was wondrous wise;  
 He jumped into a bramble bush  
 And scratched out both his eyes.

The first is extremely common as a nursery rhyme pattern, but rather rare in adult verse; the second very common in adult verse, but less so among the nursery rhymes. The latter is the stanza of many ballads and hymns (ballad meter, common meter) and very frequent in other kinds of verse. According to Schipper (*op. cit.*, pp. 186, 298), both are, like the 4-stress couplets, very old, having prototypes in late Latin and old French. The internal rhymes of the first variety merely carry further a frequent tendency of 4-stress lines to fall apart into two twos, but the short lines make the rhythmic effect of the stanza quite different from that of the second variety, so different in fact as to justify a separate classification. The stanza pattern would indeed be more fairly represented by printing the rhymed sections of the first variety as separate lines, thus:

Mistress Mary,  
 Quite contrary,  
 How does your garden grow?  
 Silver bells,  
 And cockle shells,  
 And pretty maids all in a row.

If one should attempt to describe the difference in words he might say that the form with internal rhyme gives the effect of two partial, or not wholly successful, efforts, followed by complete success on the third trial, or of two small waves followed by a third large one that runs far up the beach. In the stanza without the internal rhyme the effort is sustained throughout the whole of the 4-stress line and falls in the 3-stress line. The quick recurrence of rhymes in the first variety not only gives the stanza a quick movement and much jingle, but rhymes in such close proximity are themselves very emphatic,<sup>1</sup> and mark the stanza pattern in a striking way, features which would recommend it to the poet of the nursery more than to the poet of adults.

Between these two varieties stand several nursery rhymes which have internal rhymes in the first or third line (most frequently in the first), but not in both. For example,

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<sup>1</sup> Cf. Corson, *Primer of English Verse*, p. 23, f.

See, saw, Margery Daw,  
 Johnny shall have a new master.  
 He shall have but a penny a day,  
 Because he can't work any faster.

It is the existence of such transition cases and of the cæsural tendency in many 4-stress lines that justifies making one class of such divergent varieties.

After these in frequency comes a third four line stanza, composed of three 3-stress lines (the first, second and fourth) and one 4-stress line (the third). Like the last this form occurs in two varieties, one with internal rhyme in the 4-stress line and one without. For example,

Hickory, dickory, dock.  
 The mouse ran up the clock.  
 The clock struck one; the mouse ran down.  
 Hickory, dickory, dock.

and

Peas porridge hot,  
 Peas porridge cold,  
 Peas porridge in the pot,  
 Nine days old.

These correspond in pattern to the short meter stanza of the hymn book, and, when taken as composed of two long lines, an Alexandrine and a septinary, to the "poulter's measure" of the Elizabethan writers. Schipper (*op. cit.*, p. 199) regards it as better suited to comic verse than verse of other sorts, and single stanzas of the variety with internal rhyme (the 4-stress line being printed as two twos) were very common in the humorous columns of the newspapers a few years ago.<sup>1</sup> An interesting feature of the nursery rhymes of this pattern is that in most cases, at least of the more familiar ones, the last line is a repetition of the first, or a close approximation to it. The repetition seems to bring the whole to a close and round it off, like the return to the keynote in a piece of music.

The three groups of stanza patterns so far considered include about four-fifths of the nursery rhymes of the hundred in question, and nearly half the hymns of a hymnal examined for comparison.<sup>2</sup> Of the remaining rhymes some are of regular but infrequent forms (stanzas of 2- and of 3-stress lines, or of three 4-stress lines followed by a 3-stress line), some vary in form from stanza to stanza, and a few defy classification.

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<sup>1</sup> A single example will suffice:

A maiden, named Molly Maguire,  
 Had trouble in lighting her fire.  
 The wood being green,  
 She used kerosene;  
 She has gone where the fuel is drier.

<sup>2</sup> The revised edition of that used in the Episcopal church in this country.

Of the three more common patterns, the first has less definiteness and unity than either of the others, or depends for its unity to a considerable degree upon other than rhythmic conditions. When the four line pattern is composed of couplets, there seems little reason in the rhythm alone why it should not stop at the end of the first couplet, or go on indefinitely, couplet after couplet, as indeed it does in some cases. When the pattern is represented in bare taps (*e. g.*, with a lead pencil on the table) there seems also little reason for stopping after four groups of four taps rather than after two such groups or even after one. The unity of the couplet itself is not great, though in setting over against each other two natural rhythmic units (here two 4-stress groups) it may have a certain degree of completeness, and this may be further strengthened by the ease with which a 4-stress couplet fits into the ebb and flow of respiration, but the presence of rhyming words is important in marking off both the couplet and quatrain of this sort. Upon what other factors their rhythmic importance depends remains to be investigated.

The second pattern has distinctly more unity than the first. The 4-stress line, or the pair of 2-stress lines, with the 3-stress line following forms a whole having a definite auditory configuration, and is recognizable when reproduced in bare taps. Two such wholes constitute the stanza, which thus acquires a unity comparable to that of the couplet.

The third pattern is the most distinct and unitary of all. It comes to a definite close and has no tendency to repetition, except as a whole, a characteristic which perhaps has something to do with its fitness for single stanza humorous verses and its unfitness for general lyric use where all the stanzas must contribute toward the larger unit of the poem. It seems to stand on the same grade of unity as the single 4-stress line of the first group and the half stanzas of the second group. When represented in bare taps, it has a perfectly clear and recognizable character, and has often been used, as will be shown later, where definite and recognizable rhythmic effects are desired.<sup>1</sup>

The essential thing in all these stanza patterns appears to be the stressed syllable, or rather the group of stressed syllables recurring, at equal intervals of time, and marked off, group from group, by pauses or rhymes or both. The syllables which fill up the intervals between the stressed ones, introduce them, or follow them, seem generally to be of less importance. They make one stanza differ from another of the same pattern, but they do not change the pattern. The pattern on the contrary seems to dominate the syllables and, at least in the nursery

<sup>1</sup> Cf. Section III below.

rhymes, to force them into accord with itself. Many examples of this are to be found, especially where several syllables are crowded into a single interval, or where a single stressed syllable is extended to fill a whole one. Some of these will be noticed in the experimental section below; here we desire to speak of two or three rhymes in which, with different treatment of the syllables in question, conformity to more than one pattern is possible. In the following rhyme, for example, the first and third lines are a syllable short for the common meter pattern.

Sing a song o' six pence,  
A pocket full of rye;  
Four and twenty blackbirds,  
Baked in a pie.

If the last syllable in these lines is unstressed, the stanza pattern becomes one of four 3-stress lines—a rare one among nursery rhymes. If on the contrary the syllable immediately preceding the last is held long enough to bring a stress on the final syllable it conforms to the common meter pattern, and this as a matter of fact appears to be what often happens. The results of tests with children on this point will be given in the next section. Two lines in other stanzas of the same rhyme have the full quota of syllables, though this alone would not be conclusive; for the rhymes do not always adhere to the same pattern throughout. It is probable also that some readers bring the words to a familiar pattern in another way, namely, by taking the rhyme as a tetrameter couplet, which would make it conform to the still more common 4-stress group. Thus,

Sínġ a song o' síx pence, a pócket full of rýe;  
Fóur and twenty bláckbirds, báked in a píe.

In the following rhyme (which, however, did not occur in our hundred) there is an extra syllable in the second and fourth lines, if the rhyme is taken as having the common meter pattern, or a syllable too few if it is taken as having the long meter pattern.

Once in my life I married a wife,  
And where do you think I found her?  
On Gretna Green in a silken sheen,  
And I took up a stick to pound her.  
  
She jumped over a barberry bush,  
And I jumped over a timber,  
I showed her a gay gold ring,  
And she showed me her finger.

In the first stanza the syllables immediately preceding the last in these lines—"pound" and "found"—are of them-



selves very long, and a little further time is also required if the *h* in "her" is given distinctly—so that it is easy to make these syllables long enough to bring an extra stress on the following syllable and fit the whole to the pattern of four 4-stress lines. In the second stanza the penultimate syllables of the second and fourth lines are not so long and the tendency to stretch the lines is less strong, and perhaps would not be sufficient to keep the rhyme from falling into the common meter pattern, were it not for the influence of the stanza immediately preceding.<sup>1</sup>

In the similar rhyme beginning "See, saw, Margery Daw," the penultimate syllables of the second and fourth lines are only of moderate length, and the tendency to extend the lines to the 4-stress limit is not very marked. It is probable, however, that even this rhyme is sometimes pressed by children into the pattern of four 4-stress lines. In a musical work entitled "Mother Goose Songs without Words,"<sup>2</sup> in which a skillful musician has tried to catch the rhythm of familiar nursery rhymes as they are repeated by children, both "Sing a song o' six pence" and "See, saw, Margery Daw" are fitted with notes that indicate 4-stress lines. The same is true also of "Bye, Baby Bunting," and "Goosey, goosey, gander." The majority, however, of the group of school children tested with the former of these rhymes, gave it but three stresses per line.

Little need be said about the foot structure of the nursery rhymes, except that they are extremely free, the only requirement seeming to be that the stressed syllables should recur at approximately equal intervals. As a result of this liberty the three syllable feet are freely mixed with the two, and it is rare to find a rhyme that maintains a single type of foot throughout. Some apparent irregularities in the way of extra syllables at the beginning of lines will, however, find their proper place in the rhythm when the rhymes are written in long lines instead of short.

<sup>1</sup> Brücke in his *Physiologische Grundlagen der neuhochdeutschen Verskunst*, pp. 25 f, finds a similar result with Goethe's *Es war ein König in Thule*. When the recitation of such verses is accompanied by tapping movements of the hand, as in Brücke's experiments and in those to be discussed in the next section, the tendency is very strong to force the rhythm, natural pronunciation of the words being a little strained in order to fit the more uniform movement of the hand. Something similar seems to have been observed by Pringle. Cf. Shaw and Wrinch, *A Contribution to the Psychology of Time*. University of Toronto Studies, No. 2, p. 50.

<sup>2</sup> By Mrs. L. E. Orth, published by The Oliver Ditson Co., Boston, 1897. The composer has endeavored by a series of simple pieces embodying the familiar rhythms of the nursery rhymes to pave the way for children to a comprehension of rhythms as expressed in the ordinary musical notation.

It would be an interesting question, finally, to ask how it happens that the three chief stanza patterns hold the place they do among the nursery rhymes and in serious verse. It is easy to say, and doubtless in large measure true, that they owe their unique position now to their great frequency in the past. We have been trained to them as we have to the ordinary church cadences and the return to the keynote, but the question remains of why they came into frequent use originally, and the answer must probably be looked for outside the data obtainable by a study of the forms themselves.

## II. AN EXPERIMENTAL STUDY OF THE RHYTHMS OF NURSERY RHYMES.

*Purpose and Method.* Our purpose in undertaking an experimental study of these rhymes was one that must have suggested itself to every student of rhythm, namely, to secure, if possible, some objective record of rhythms as they actually occur in spoken verse.

The way in which we finally approached the question, after much preliminary testing, was essentially like one of those used by Brücke, though improved, as we believe, in some particulars.<sup>1</sup> In both methods the rhythm was tapped by the finger

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<sup>1</sup>Brücke: *Die physiologischen Grundlagen der neuhochdeutschen Verskunst*, Wien, 1871, pp. vii, 86. His methods were at the time unknown to us.

A few words with regard to the methods of Brücke and others may be added here. Brücke made use of two methods, the first for studying the relations of the stressed syllables in the line or stanza, the other for determining the quantities of the syllables in the foot. The first (*op. cit.*, p. 23) consisted in marking each arsis, or each arsis carrying an ictus, with a quill on an evenly revolving kymograph drum, while reciting verse of different kinds. In the second method (p. 32, ff.) the lip movements were recorded during the pronunciation of certain lines specially constructed in syllables involving labial consonants to show characteristic foot structures. The lip movements were traced by means of a thin strip of wood, fast at one end, and resting at the other on the speaker's lip. At a suitable place a writing point was attached for inscribing on the drum surface.

Hurst and McKay (*Experiments on the Time Relations of Poetical Meters*, University of Toronto Studies, Psychological Series, No. 3, 1899) were, unknown to us, at work at about the same time on a closely related problem and by a similar method, a refinement of Brücke's first method. Their plan was to have the syllables of ten or twenty successive feet of standard selections marked while the subject scanned them silently, or to have series of feet of the standard forms (dactyl, anapest, etc.) tapped off empty, *i. e.*, without words, while attention was concentrated on the rhythm. It is important to note that in using the tapping method for the marking of the constituent elements of the foot instead of the interval from arsis to arsis the work of Hurst and McKay approaches that of Brücke with his second method, while ours is like that by his first method.

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in accompaniment to the voice reciting the lines, but in ours a voice record also was taken by one of the methods used by Rousselot and more recently by Bourdon.<sup>1</sup> For the finger record a small receiving tambour, placed conveniently to hand on the table, received the taps and communicated them to an inscribing tambour which in turn transferred them to the smoked surface of a kymograph drum, each tap being marked by a sharp departure of the pointer from the base line. For the voice record a short tube of large diameter fitted with a suitable mouth-piece led directly into the metal box of a tambour, the stylus of which traced on the drum the impulses communicated to it by the breath of the speaker. For a time line an interrupter giving tenths of a second was used, and the speed of the drum was such as to allow the reading of these by estimation in tenths, making the unit of measurement 0.01 second.

Records were taken during the course of the experiments upon a number of different subjects, but in small number, and only those taken upon the writers will be considered here, except in the case of certain tests made upon school children. Eleven rhymes were studied sufficiently for report. Five of them were of the long meter or other 4-stress patterns, as follows :

Georgie, porgie, pudding and pie,  
Kissed the girls and made them cry.  
When the boys came out to play,  
Georgie, porgie, ran away.

Intery, mintery, cutery, corn,  
Apple seed and apple thorn ;  
Wire, brier, limber, lock ;  
Three geese in a flock ;  
Sit and sing by a spring ;  
O, U, T, and in again.

Diddle, diddle, dumpling, my son John  
Went to bed with his stockings on ;  
One shoe off and one shoe on,  
Diddle, diddle, dumpling, my son John.

There was an old woman, and what do you think,

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VII, 1899, pp. 95, ff.) has made an exhaustive study by refined methods of the first stanza of "Who Killed Cock Robin?" but as the rhyme was apparently read rather than scanned and is one of the more complicated ones metrically, his study and ours do not overlap to any considerable extent.

These researches are the only ones known to us, if we except the brief account of results given by Meumann, in which the particular matter in hand has been approached in an experimental way. The results reached, so far as they have to do with our own, will be spoken of in the text as occasion arises.

<sup>1</sup>Bourdon : L'Application de la méthode graphique à l'étude de l'intensité de la voix, *L'Année psychologique*, 1897, 369-378.

She lived upon nothing but victuals and drink.  
 Victuals and drink were the chief of her diet,  
 And yet this old woman could never keep quiet.

There was an old woman that lived in a shoe;  
 She had so many children she did n't know what to do.  
 So she gave them some broth without any bread,  
 And whipped them all soundly and sent them to bed.

Those of the second, or common meter, class were:

See, saw, Margery Daw;  
 Johnny shall have a new master.  
 He shall have but a penny a day,  
 Because he can't work any faster.

Mistress Mary, quite contrary,  
 How does your garden grow?  
 Silver bells and cockle shells,  
 And pretty maids all in a row.

Old King Cole was a merry old soul,  
 And a merry old soul was he.  
 He called for his pipe and he called for his bowl,  
 And he called for his fiddlers three.

If all the world were apple pie,  
 And all the sea were ink,  
 And all the trees were bread and cheese,  
 What should we do for drink?

Hey! diddle, diddle, the cat and the fiddle;  
 The cow jumped over the moon.  
 The little dog laughed to see such sport,  
 And the dish ran away with the spoon.

The single example of short meter was

Hickory, dickory, dock,  
 The mouse ran up the clock;  
 The clock struck one, the mouse ran down.  
 Hickory, dickory, dock.

Our main dependence in the working up of the combined hand and voice records has been that of the hand. The means employed for recording the voice are imperfect, really furnishing a record of the movements of the breath and not that of the vocal intensities at all. From such a record alone it would therefore be quite impossible to get any picture of the rhythm. The voice record, however, does enable us, at least in the case of the explosive consonants (*p*, *b*, *k*, and *c* and *g* hard) to determine with some exactness how nearly the finger tap agrees with the vocal stress.<sup>1</sup> That the voice and hand should keep in close coincidence was of course to be expected in view of the strong natural tendency to beat time in some

<sup>1</sup> Brücke, *op. cit.*, p. 24, f., and 32.

way or other, but an objective determination of the degree of exactness is not wholly without interest. The relation between the hand and voice has been carefully worked out for both subjects with the rhyme "Georgie, porgie," which is rich in these consonants. In few cases does the average difference between the hand and voice (average of ten trials) exceed 0.02 sec. Once in the case of S with the word "boys," the difference reaches 0.049, but this is so much larger than the rest that an error is probable either in locating the point of the voice curve corresponding to the beginning of the *b* or in supposing that in the enunciation of this subject the stress in this syllable falls close to the consonant and not later in the diphthong following. The other cases all lie below 0.03. In the record of S for "Mistress Mary" the same relations are true, except for the first syllable of "pretty" where the average difference is 0.022, and for "bells" where it is 0.031. When the mean variations are examined it is found that in "Georgie, porgie" they exceed 0.02 in two cases, once for each subject, the highest being 0.03 sec. In "Mistress Mary" for S there are also two instances the highest being 0.026. The differences of hand and voice are larger than could be wished, yet, even if we take the extreme cases (excluding only that of S with the word "boys") we find that they rarely exceed the limit laid down by Meumann (0.02);<sup>1</sup> and if we take in the same way the largest mean variations, we find that none correspond to a probable error in the averages of ten of more than 0.01 sec. There would, therefore, appear to be sufficient justification for taking the finger record, within the limits indicated, as synchronous with the vocal stress.

It should not be inferred that the tapping introduced a distraction into the recitation of the rhymes, for this was not the case. From the first the tapping was practically automatic, and no difficulty at all was found in doing both at once. The effect of the tapping, as has been intimated in the preceding section, was probably of quite another sort, tending to enforce by its own regularity, a greater steadiness on the recitation than would usually be expected in vocal utterance. In the case of genuine poetry this would certainly be a serious, and, we believe, a fatal, objection to the method, but in the case of the nursery rhymes, where the usual recitation often approaches scanning, the greater regularity, if introduced, would seem to be a secondary matter. Nevertheless the fact should not be neglected in inferences based upon the results to be given. In taking the records the rhymes were recited in the

<sup>1</sup>Untersuchungen zur Psychologie und Ästhetik des Rhythmus, Wundt's Studien, X, 1894, p. 419.

child's fashion, making the rhythm prominent, nearly to the full extent of scanning.

*General Rate of Recitation.* A question that naturally arises in discussions of rhythm is whether or not there is anything like a fixed individual rhythm to which the reading of each subject tends to conform itself. The answer which our experiments give to this question is partly affirmative and partly negative. The subject S read more rapidly than T with nine out of the eleven rhymes used, and often by a very considerable amount, and other experiments have shown a similar tendency in his reading of other sorts of verse. There would thus appear to be a certain relative constancy of type—quick, moderate or slow—in the rate selected, but not one by any means that excludes differences, *e. g.*, between repetitions of the same rhyme on different occasions, especially with different mental conditions, between different rhymes of the same metrical pattern, or between rhymes of different pattern. This will be clear from the following table in which are given the average foot or more exactly the average interval between arsis and arsis for the different rhymes studied. In calculating this all partial feet and all feet affected by the regular rhythmic pauses have been excluded.<sup>1</sup>

TABLE I.

*Showing in seconds the average interval between stresses.*

LONG METER PATTERN.	S.	T.
Georgie, porgie,	0.458	0.516
Intery, mintery,	0.548	0.566
Diddle, diddle, dumpling,	0.471	0.527
There was an old woman, and what do you think?	0.476	0.568
There was an old woman that lived in a shoe,	0.652	0.620
COMMON METER PATTERN.		
Mistress Mary,	0.503	0.562
Old King Cole,	0.522	0.616 <sup>2</sup>
Hey! diddle, diddle,	0.322 <sup>3</sup>	0.458 <sup>4</sup>
See, saw, Margery Daw,	0.548	0.533
If all the world were apple pie,	5.406	0.484
SHORT METER PATTERN.		
Hickory, dickory, dock,	0.361	0.452

<sup>1</sup> The averages are given in this case without the mean variations, which would have required an amount of extra figuring quite disproportionate to the additional value afforded by them. Their size can be judged with sufficient exactness from those given in Table II, where the intervals are presented in percentages with their corresponding mean variations.

<sup>2</sup> Average of 9 repetitions.

<sup>3</sup> Average of 7 repetitions.

<sup>4</sup> Average of 8 repetitions.

An examination of this table will show the individual differences in rate above referred to and also differences depending on other causes. It is evident that the character of the rhyme itself is decidedly important. Both subjects agree in the main in the relative rates at which they take the rhymes, as appears in the following columns where the rhymes are arranged in their order of rate from the slowest to the quickest.

## SUBJECT S.

There was an old woman that  
lived in a shoe.  
See, saw, Margery Daw.  
Intery, mintery.

Old King Cole.  
Mistress Mary.  
There was an old woman, and  
what do you think?  
Diddle, diddle, dumpling.  
Georgie, porgie.  
If all the world were apple pie.  
Hickory, dickory, dock.  
Hey! diddle, diddle.

## SUBJECT T.

There was an old woman that  
lived in a shoe.  
Old King Cole.  
There was an old woman, and  
what do you think?  
Intery, mintery.  
Mistress Mary.  
See, saw, Margery Daw.

Diddle, diddle, dumpling.  
Georgie, porgie.  
If all the world were apple pie.  
Hey! diddle, diddle.  
Hickory, dickory, dock.

Just what caused these differences in rate of recitation is not altogether clear. The number of syllables, their absolute quantity, and the phonetic labor involved in them are probably important factors, but may be overpowered in particular cases by others. It seems possible that the syllables of the first foot or two by their quick or slow movement may set the rate for the rhyme as a whole, making "Hey! diddle, diddle," for example, rapid, and "Old King Cole" slow. Familiarity may also influence the rate, for though all the rhymes used were familiar, some had progressed further toward complete automatism than others. And lastly the images suggested by the rhymes—especially those of movement may have an effect—as, for example, in the case of S with "See, Saw, Margery Daw" where the slow movement suggested by the rising and falling "see-saw" very possibly set the time for the whole. Whether the general emotional tone is sufficiently different to exercise an independent influence is so far a matter of conjecture.<sup>1</sup>

*Relative Length of Intervals in Different Portions of the Line and Stanza.* In order to present these differences unobscured by variations due to causes lying outside the rhyme itself, it

<sup>1</sup> It has been suggested that the similarity in the relative rates given to the various rhymes by the two subjects was due in part to unconscious imitation, for each subject heard the other recite. This may be possible; but in view of the decided difference in absolute rate between the subjects, and the different rates given to "See Saw" and "There was an old woman, and what do you think?" we are not inclined to attach very much importance to it.

has seemed better to give the foot lengths (intervals between stresses as marked by the finger taps) in percentages of the total time required for reciting the rhyme, instead of in the time values obtained directly from the kymograph sheets.<sup>1</sup> These percentages with their corresponding mean variations are given in the several parts of Table II inserted at the end of this section. Each figure is the average of ten percentage records (except where the contrary is specified) calculated from the original time values. The average recitation time in seconds is given for each rhyme immediately following the initial of the subject, and from this the actual time of any interval can be calculated approximately should any one desire to do so. To these have been added a few records of tappings of the three standard patterns without recitation of any rhymes whatever, simply as pure metrical patterns. Little importance was attached to these when they were taken, and they are therefore very few in number, but they are so consistent with themselves and have proved so interesting in connection with the records of the rhymes that it has seemed worth while to publish them. These records are given complete in units of 0.01 sec.

In discussing this table we shall consider first those general features which throw light upon the recitation of all the rhymes, then those that have to do with the different stanza patterns and individual rhymes, and finally such indications as appear with reference to the rate of recitation of feet of various forms.

It will be noticed that there is a rough equality in the figures

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<sup>1</sup> The "total time" referred to in the text was measured from the beginning of the first finger tap to the end of the voice record, except in the case of the rhyme "Mistress Mary" with subject S, where the end of the voice record could not be determined with sufficient accuracy, and the time used was that between the first and last finger taps. The record does not include the time of introductory syllables such as occur in three of the rhymes, which were not easy to measure with certainty by the method employed. In the case of these rhymes the record is therefore incomplete, though not to a degree to invalidate it in any way for the purposes to which we shall apply it. The part of the voice record following the last finger tap was secured by having the subject take breath instantly after the enunciation of the last syllable while his mouth was still in contact with the mouth-piece. This introduced a sharp and unmistakable fall in the voice tracing which was taken as marking the end of the recitation. The determinations thus obtained are a little too large, but probably by an insignificant amount—less we believe than the usual reaction time. The criticism may possibly be offered that the effort to mark the end of the rhyme in this way may have led to a slight quickening of the last foot or two. We regret that we cannot at present furnish absolutely conclusive evidence to the contrary, but as the taking of the breath at that point soon became automatic, we are not inclined to think that the length of the adjacent intervals was seriously affected by this cause.



for the intervals except where they are lengthened by pauses, as in the seventh interval of the common meter pattern and in the third and sixth of the short meter pattern, or where the figure stands for a terminal syllable, as is the case with the last figure given for each rhyme. This is in accord with Brücke's generalization (*op. cit.*, pp. 23, f.) and the results of Hurst and McKay (*op. cit.*, p. 66), but it is also clear that the uniformity is only an approximate one, and subject to considerable variations. One of the most striking of these is a progressive quickening in rate from first to last of the recitation. This occurred with S in all of the rhymes, and with T in all but two, as appears in the following table in which are set over against each other the average percentages for complete intervals in the first and second halves of the rhymes.

TABLE III.

*Showing average percentages for complete intervals in the first and second halves of the rhymes.*

RHYMES.	SUBJECTS.	FIRST HALF.	SECOND HALF
Georgie, porgie,	S	6.57	6.19
	T	6.63	6.25
Intery, mintery,	S	4.29	4.18
	T	4.25	4.15
Diddle, diddle, dumpling,	S	6.44	6.23
	T	6.50	6.37
There was an old woman, and what do you think?	S	6.39	6.19
	T	6.57	6.23
There was an old woman that lived in a shoe,	S	6.67	6.23
	T	6.54	6.23
Mistress Mary,	S	7.38	7.07
	T	7.10	7.00
Old King Cole,	S	6.95	6.75
	T	7.38	7.07
Hey! diddle, diddle,	S	6.78	6.75
	T	6.95	7.15
See, saw, Margery Daw,	S	7.11	6.30
	T	7.10	6.53
If all the world were apple pie,	S	6.78	6.51
	T	6.95	6.85
Hickory, dickory, dock,	S	7.30	6.84
	T	7.68	7.86

The only rhymes for which this relation does not hold are "Hey! diddle, diddle," and "Hickory, dickory, dock," where it fails for T. A portion of this difference comes in some cases from an unusual length in the initial interval and an unusual brevity in the last, but the whole tendency is not to be explained in this way. The progressive decrease in time appears even when the rhymes are taken line by line. The averages of the feet

in the successive lines of the rhymes of the 4-stress group are given in Table IV. The facts revealed by them are also true of those of the other patterns.

TABLE IV.

*Showing average percentages for complete intervals in the successive lines of rhymes of the 4-stress group.*

RHYMES	Sub- jects	1st Line	2nd Line	3rd Line	4th Line	5th Line	6th Line
Georgie, porgie,	S	6.83	6.30	6.10	6.10	—	—
	T	6.90	6.37	6.43	6.07	—	—
Intery, mintery,	S	4.33	4.13	4.23	4.17	4.23	4.00
	T	4.30	4.10	4.23	4.07	4.27	4.03
Diddle, diddle, dumpling,	S	6.53	6.23	6.26	6.06	—	—
	T	6.70	6.26	6.53	6.23	—	—
There was an old woman, and what do you think ?	S	6.60	6.20	6.16	6.23	—	—
	T	6.86	6.40	6.36	6.20	—	—
There was an old woman that lived in a shoe,	S	6.96	6.33	6.36	6.10	—	—
	T	6.70	6.50	6.30	6.13	—	—

Reasons for either the general acceleration or the long initial and short terminal intervals are not very obvious. A variety of more or less plausible conjectures offer themselves. There is possibly a certain amount of inertia in both hand and vocal apparatus at the start, which gives place, as the tapping and recitation progress, to an increasing facility of action due to "warming up" or a local practice, or to the mild excitement of making the experiment.<sup>1</sup> Relatively careful beginnings with rapid and careless endings are not uncommon elsewhere. Observation of a person reading prose aloud will reveal a similar tendency. While the idea is rising into consciousness the words are pronounced slowly and with em-

<sup>1</sup> For the effect of moderate excitement on tapping rates see Dresslar, Some Influences which Affect the Rapidity of Voluntary Movement, *American Journal of Psychology*, IV, 1891-92, p. 523; also Nichols, The Psychology of Time, *Ibid.*, p. 83.

One of the writers believes that the greatest cause of change probably lies in the relation to consciousness of the words in which the rhyme is clothed. The apperceptive effort is high, and the reading rate slow, at the beginning of the stanza and of each phrase, but the effort declines, and a corresponding increase of the reading rate occurs, when the main work of comprehension is for the moment over. This would be but another instance of the general law of economy in accordance with which all our activities tend to be performed with the least possible expenditure of nervous energy.

phasis; having reached the focal point of the idea, however, the remainder of the sentence is hurried out of the way in a more or less indiscriminative mumble. Closely connected with this, doubtless, is the prominence which, according to the rhetoricians, belongs to the first part of a sentence or phrase, for slowness is a normal mark of emphasis. In rapid writing, also, sufficient words of a sentence to carry the meaning are written legibly, the rest less perfectly. A long word may end in a straight line, the writer trusting to the opening syllable and the context to make the thought understood. That the causes are general rather than special is probable from the fact that the same relations hold in some cases, at least, when the patterns in question are executed in bare taps (*cf.* Table II, Pt. v, on the last of the inserted sheets at the end of this section), and similar tendencies have been found even in uniform tapping under certain conditions by experimenters upon time judgments who have made use of the tapping method.<sup>1</sup>

If Table II is examined with reference to the stanza patterns, it will be found that certain of the intervals show characteristic differences. The most striking of these are those which mark off the half stanzas in the common meter pattern and the first two 3-stress lines in the short meter pattern. These are more marked in the case of S, but appear in the records of both subjects, even when the patterns are given in bare taps. In the common meter pattern the interval is often nearly or quite double that of the ordinary intervals. In the short meter pattern its excess ranges from about one-seventh to more than two-thirds of the intervals on either side. The interval in these cases is taken up partly with the completion of the enunciation of the stressed syllable immediately preceding (what proportion can be roughly estimated from that of the last syllable of the rhyme), by a pause, and by the introductory syllable of the following stress when there is one. Such pauses are often used also for taking breath. In the long meter pattern there is also a tendency to mark the line groups by lengthening the interval between the final stress of one line and the initial stress of the succeeding one, but by no means so pronounced. If the general average for this group is consulted (Table II, Pt. i), it will be found that S invariably lengthens these intervals (and also shortens the first interval of the new line). The amounts in question are very small, but the relation can be traced in most of the averages for the single rhymes of the group and is clear in the records of the bare tapping (*cf.* Pt. v). The same relation appears in T's record with bare taps and in some of the averages

<sup>1</sup> Nichols, *op. cit.*, p. 82.

for the single rhymes, but does not appear in the general average and fails distinctly in some of the single rhyme averages. In some cases, however, it may possibly be hidden or neutralized by T's tendency to lengthen the first interval of the line.

The smaller rhythmic periods—couplets and lines—are not further divided by measurable lengthening of special intervals (except as already noticed in the case of the first two 3-stress lines of the short meter pattern), not even in the case of 4-stress lines with internal rhyme. In the bare tap rhythms, however, there are traces of such a method of demarcation (*cf.* Pt. v).<sup>1</sup> The general tendency to increase of rate within the subordinate groups is, however, not without an influence. It gives to the 3-stress lines in the common meter pattern a quicker movement than the 4-stress lines, and may thus be partially responsible for the "falling" character which they seem to have. The subjects differ so much in their rates for the second half of the short meter pattern that conclusions cannot be drawn from the table as to its movement.

It remains to speak of the size of the intervals in relation to foot structure, in other words to the nature of their syllable contents. In the rhymes used there is a considerable variety in this respect, ranging from intervals containing but a single syllable, as in the first two of "See, saw, Margery Daw," to those containing four as in the fifth and seventh of "There was an old woman that lived in a shoe" or the first of "Diddle, diddle, dumpling." Yet few differences are apparent in the figures that can be referred directly to this cause, a result to be expected, perhaps, in view of the prominence given to the rhythm in reciting. It cannot be doubted that when adult verse is read for its meaning as well as metrical structure, very material differences in intervals are to be found. There is reason, indeed, to think that the overfull intervals in "There was an old woman that lived in a shoe" break into the regular movement of the pattern as the rhyme is ordinarily recited by children, though, as will presently be shown, they can bring it into complete uniformity when necessary.

Three of the rhymes—the two about the old women and "If all the world were apple pie," are in iambic-anapestic movement—the last in perfect iambs throughout. The remaining eight are trochaic-dactylic. It does not appear, so far as our results go, that these differences affect the length of the

<sup>1</sup> Such a difference between the verse rhythm and that of bare taps is not unexpected, for the tapped rhythms, having to depend chiefly upon quantity, are at a disadvantage compared with those in vocal form which have at their disposal rhyme, pitch and intensity in addition.

intervals or the general rate of recitation in any uniform way. It is not so much in the general rate of the line as at the beginning and end, where the presence or absence of an extra syllable makes the difference between an abrupt or a gradual beginning, or ending, or sets the character of the movement for the whole that these prosodic differences are effective; though there may also be a difference of movement within the interval, if Hurst and McKay are correct in their measurements of the short syllables in the theses of dactylic and anapestic feet. These authors report characteristic differences in rate for the different feet and conclude that "the dactylic foot tends to be shorter than the anapestic and the trochaic than the iambic" (*op. cit.*, p. 66, f.). This, however, runs counter to common observation, at least with reference to the anapest,<sup>1</sup> and does not hold in our experiments on the rhymes. In Table I, for example, it appears that the pure iambic rhyme "If all the world were apple pie" has a shorter average foot than "Georgie, porgie," which is almost exclusively trochaic. The same table also shows that rhymes containing the same sorts of feet may differ very widely in their rates of recitation. We cannot but think that these authors have been led into error in this particular. A very large number of experiments would be necessary to establish such a difference as they describe; for even the difference between dactyls and trochees and between anapests and iambs disappears when they occur in the same line and the line is scanned.

*Observations on the Rhythm of Nursery Rhymes as Recited and Tapped by Children.* As a supplement to the experiments above reported, and particularly as a test of the manner in which some of the rhymes which do not quite fit the ordinary patterns would be handled by the children themselves, one of us undertook the observation of a number of young children in one of the public schools of the city.<sup>2</sup> Over forty children of an average age of ten years were tested in all. They were taken singly and, without any suggestion, required to recite several of the rhymes, tapping the rhythm at the same time with the finger. As they are accustomed to do something similar in the counting-out rhymes and in music, they found no difficulty in doing so. The results may be summarized as follows:

Of fifteen children asked to tap the rhythm in "Bye Baby

<sup>1</sup> Coleridge, for example, in the familiar poem in which he illustrates the common forms of feet characterizes them particularly as "the swift anapests."

<sup>2</sup> It is a pleasure to acknowledge here our indebtedness to the Worcester school authorities and to Miss Ella L. Dwyer, the principal of the Oxford St. School, for the opportunity of testing these children.

Bunting" four gave four accents to the line, ten beat it in three and one in two beats. "Diddle, diddle, dumpling" was given in the common meter pattern by nine out of sixteen children. Seven others gave it differently, chiefly in three stress lines, all or nearly all failing to take the somewhat more difficult adaptation to the long meter pattern that we ourselves used in the measurements above reported. Forty-four children recited the familiar rhyme, "Sing a song o' six pence." Of these twenty-seven gave four stresses to the first and third lines, four gave them three stresses, and thirteen two stresses. It was found that the children were satisfied with any of these simple rhythms, and if asked to change did so readily. The fourth line of "Mistress Mary"—"And pretty maids all in a row"—which contains the long syllable "maids" where a short one would be expected, was given in regular time by nineteen children and irregularly by nine. There seemed to be little difficulty where the rhyme was well known. In "There was an old woman that lived in a shoe" the line "She had so many children she didn't know what to do," which contains two feet with supernumerary syllables was taken rhythmically by thirty-three and irregularly by seven children.

A further test was made by placing before each child in his turn a card on which was written

1	2	3	4	5
I	caught	a	hare	alive
6	7	8	9	10
I	let	it	go	again

and requesting him after reading it to himself to read it aloud. Two-thirds of the children read the numerals rhythmically, putting the stress on the 1, 3 and 5 of the first line and 6, 8 and 10 of the third, and in nearly all cases strengthened the accent on repetition.

These tests give evidence both of the facility with which children reduce recalcitrant lines to conformity with the rhythmical patterns and of a freedom in the selection of patterns in doubtful cases. How far the cases in which the rhymes were recited irregularly show habits of repeating them in that way cannot be said, but it is not unlikely that some rhymes are never forced into perfect rhythm by a considerable number of children. These satisfy themselves with the regularly rhythmized portions and get over the irregular portions in the easiest way they can. A more extended study of the rhymes as recited by children when saying them with perfect freedom, without the constraint of tapping or the presence of an unfamiliar observer, would be an interesting and important contribution to the subject.

The general results of this section of our studies may be summarized as follows:

1. We find, with previous investigators, a general uniformity in the intervals between stresses (except when they contain the pauses that mark off the larger rhythmic periods), but also that there is, in the rhymes as a whole and in the rhythmic periods within them, a tendency to a quickening in rate from first to last.
2. The characteristic movement of the most frequent patterns depends partly on the distribution of pauses and partly perhaps on this tendency to increase of rate.
3. The tests on school children show a general tendency on their part to force imperfectly worded rhymes into conformity with one or the other of the more common patterns, but also a certain freedom as to the pattern selected.

### III. COLLEGE YELLS.

Perhaps in no field is the phenomenon of rhythm—pure rhythmic noise—more strikingly displayed than in the yells and cheers of college students. From the list published in the *World Almanac* for 1895 and various other sources a collection of fully two hundred college yells has been made, and these have been examined with reference to metrical pattern. While it is not possible in every case to tell from the printed text in just what rhythmic form the cheers are actually given, several points of considerable interest are apparent. The same metrical patterns are found as in the nursery rhymes, but in strikingly different proportions. Yells based on any of the pure 4-stress patterns or on the common meter pattern are infrequent, while yells conforming exactly to the short meter pattern are extremely common, forming as much as a quarter of the whole list, without including many imperfect examples. Several of the yells of the 4-stress group appear to follow the couplet pattern, others the pattern of three 4-stress lines followed by a more or less perfect 3-stress line, and few, if any, that of the long meter stanza.<sup>1</sup> Among the yells were also found several examples of a metrical pattern not represented at all in our list of nursery rhymes, though not wholly unknown to children. It consists of a two followed by a three. Here is an example: Rah, Rah! Rah, Rah, Rah! Rah, Rah! Rah, Rah, Rah! Swarthmore. This is evidently based on the drill sergeant's Left, Left! Left, Right, Left! In the political cam-

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<sup>1</sup> One of the writers of this study is inclined to regard some of the cases here classed as 4-stress yells as really 2-stress yells. From the data at hand it is perhaps impossible to say whether the two 2's constituting the four are to be regarded as subordinate groupings or not.

TABLE II. Part i.  
*Giving the average total time in seconds required for the recitation of rhymes of the LONG METER pattern together with the relative values of the intervals expressed as averages of the total times.*

	Av. total time.	Georgie,	porgie,	pudding and	pie;	Kissed the	girls and	made them	cry.	When the	boys came	out to	play,	Georgie,	porgie,
S. V.	7.198	7.1	6.8	6.6	6.7	6.2	6.3	6.4	6.6	5.8	6.0	6.5	6.7	6.4	6.3
M. V.	8.036	.33	.30	.14	.13	.28	.26	.26	.20	.19	.24	.27	.37	.32	.29
T.	.183	7.4	6.8	6.5	6.6	6.2	6.4	6.5	6.4	6.1	6.8	6.4	6.3	6.3	6.2
M. V.		.42	.23	.22	.29	.24	.15	.21	.20	.31	.22	.25	.24	.22	.23
		Diddle, diddle	dumping.	my son	John	Went to	bed with his	stockings	on.	One shoe	off, and	one shoe	on,	Diddle, diddle	dumping
S. V.	7.414	6.4	6.6	6.6	6.7	5.9	6.3	6.5	6.7	6.3	6.4	6.1	6.6	5.7	6.4
M. V.	.160	.40	.21	.31	.18	.09	.20	.37	.18	.14	.18	.30	.24	.26	.34
T.	8.262	6.7	6.7	6.7	6.6	6.3	6.0	6.5	6.3	6.9	6.2	6.5	6.3	6.2	6.4
M. V.	.186	.29	.41	.20	.23	.24	.13	.11	.22	.29	.17	.36	.24	.20	.23
	There	was an old	woman, and	what do you	think? She	lived upon	nothing but	victuals and	drink.	Victuals and	we were the	chief of her	diet and	Yet this old	woman cou
S. V.	7.493	6.9	6.8	6.1	6.3	6.2	6.3	6.1	6.5	6.0	6.4	6.1	6.1	6.3	6.3
M. V.	.140	.38	.31	.23	.19	.16	.35	.21	.18	.14	.27	.27	.33	.25	.29
T.	8.885	7.4	6.9	6.3	6.2	6.8	6.2	6.2	6.2	6.4	6.2	6.5	5.9	6.4	6.2
M. V.	.154	.48	.15	.15	.17	.19	.14	.21	.16	.26	.33	.21	.23	.23	.30
	There	was an old	woman, that	lived in a	shoe. She	had so many	children she	didn't know what to	do. So she	gave them some	broth with-	out any	bread, and	whipped them all	soundly an
S. V.	10.057	7.5	6.9	6.5	6.7	6.3	6.5	6.2	6.4	6.7	6.3	6.1	6.1	6.3	6.4
M. V.	.181	.24	.27	.22	.23	.20	.17	.19	.18	.36	.22	.16	.22	.35	.21
T.	9.619	7.1	6.8	6.2	6.2	7.2	5.9	6.4	6.5	6.7	6.1	6.1	6.3	6.5	5.9
M. V.	.189	.28	.27	.37	.30	.28	.31	.21	.30	.23	.28	.36	.12	.26	.31
Averages of the percentage values of the inter-vals.		S. 6.98 T. 7.15	6.78 6.80	6.45 6.43	6.60 6.40	6.15 6.63	6.35 6.13	6.30 6.40	6.55 6.35	6.20 6.53	6.28 6.33	6.20 6.38	6.38 6.20	6.18 6.35	6.35 6.18



TABLE II. Part i.  
*average total time in seconds required for the recitation of rhymes of the LONG METER pattern together with the relative values of the intervals expressed as average percentages of the total times.*

Georgie,	porgie,	pudding and	pie;	Kissed the	girls and	made them	cry.	When the	boys came	out to	play,	Georgie,	porgie,	ran a-	way.
7.1 .33 7.4 .42	6.8 .30 6.8 .23	6.6 .14 6.5 .22	6.7 .13 6.6 .29	6.2 .28 6.2 .24	6.3 .26 6.4 .15	6.4 .26 6.5 .21	6.6 .20 6.4 .20	5.8 .19 6.1 .31	6.0 .24 6.8 .22	6.5 .27 6.4 .25	6.7 .37 6.3 .24	6.4 .32 6.3 .22	6.3 .29 6.2 .23	5.6 .23 5.7 .23	4.5 .29 3.8 .25
Me, diddle	dumping.	my son	John	Went to	bed with his	stockings	on.	One shoe	off, and	one shoe	on,	Diddle, diddle	dumping,	my son	John.
6.4 .40 6.7 .29	6.6 .21 6.7 .41	6.6 .31 6.7 .20	6.7 .18 6.6 .23	5.9 .09 6.3 .24	6.3 .20 6.0 .13	6.5 .37 6.5 .11	6.7 .18 6.3 .22	6.3 .14 6.9 .29	6.4 .18 6.2 .17	6.1 .30 6.5 .36	6.6 .24 6.3 .24	5.7 .26 6.2 .20	6.4 .34 6.4 .23	6.1 .16 6.1 .27	4.8 .42 4.3 .34
as an old	woman, and	what do you	think? She	lived upon	nothing but	victuals and	drink.	Victuals and	were the	chief of her	diet and	Yet this old	woman could	never keep	quiet.
6.9 .38 7.4 .48	6.8 .31 6.9 .15	6.1 .23 6.3 .15	6.3 .19 6.2 .17	6.2 .16 6.8 .19	6.3 .35 6.2 .14	6.1 .21 6.2 .21	6.5 .18 6.2 .16	6.0 .14 6.4 .26	6.4 .27 6.2 .33	6.1 .27 6.5 .21	6.1 .33 5.9 .23	6.3 .25 6.4 .23	6.3 .29 6.2 .30	6.1 .36 6.0 .33	4.7 .31 4.1 .43
as an old	woman, that	lived in a	shoe. She	had so many	children she	did n't know what to	do. So she	Gave them some	broth with-	out any	bread, and	whipped them all	soundly and	sent them to	bed.
7.5 .24 7.1 .28	6.9 .27 6.8 .27	6.5 .22 6.2 .37	6.7 .23 6.2 .30	6.3 .20 7.2 .28	6.5 .17 5.9 .31	6.2 .19 6.4 .21	6.4 .18 6.5 .30	6.7 .36 6.7 .23	6.3 .22 6.1 .28	6.1 .16 6.1 .36	6.1 .22 6.3 .12	6.3 .35 6.5 .26	6.4 .21 5.9 .31	5.6 .24 6.0 .34	2.8 .25 3.2 .22
6.98 7.15	6.78 6.80	6.45 6.43	6.60 6.40	6.15 6.63	6.35 6.13	6.30 6.40	6.55 6.35	6.20 6.53	6.28 6.33	6.20 6.38	6.38 6.20	6.18 6.35	6.35 6.18	5.85 5.95	4.20 3.85

TABLE II. Part ii.

*Giving the average total time in seconds required for the recitation of rhymes of the COMMON METER pattern, together with the relative values of the intervals expressed as average percentages of the total times.*

	Av. total time.	Mistress	Mary	quite con-	trary,	How does your	garden	grow?	Silver	bells and	cockle	shells. And	pretty maids	all in a	row.
S. M. V. T. M. V.	6.941 .213 8.013 .386	7.8 .31 8.0 .56	7.9 .37 7.0 .44	7.4 .20 7.1 .44	7.6 .33 7.2 .26	6.7 .14 6.8 .29	6.9 .25 6.5 .30	13.0 .91 12.4 1.08	7.2 .16 7.6 .43	7.3 .24 6.9 .45	7.1 .25 6.8 .19	7.3 .32 6.7 .27	6.8 .15 7.1 .32	6.7 .24 6.9 .43	3.5 .37
		* Old King	Cole was a	merry old	soul, And a	merry old	soul was	he. He	called for his	pipe and he	called for his	bowl and he	called for his	fiddlers	three.
S. M. V. T. M. V.	7.530 .322 9.406 .267	7.4 .24 8.6 .67	7.3 .29 7.4 .27	6.7 .42 7.2 .33	7.1 .33 7.3 .14	6.8 .21 6.9 .33	6.4 .36 6.9 .39	12.6 .94 8.9 .50	7.5 .33 7.2 .24	6.7 .20 7.6 .25	6.9 .26 7.1 .27	6.7 .30 7.2 .14	6.8 .23 6.9 .40	5.9 .41 6.4 .26	4.0 .55 3.7 .29
		† Hey! diddle,	diddle, the	cat and the	fiddle, the	cow jumped	over the	moon. The	little dog	laughed to	see such	sport and the	*dish ran a-	way with the	spoon.
S. M. V. T. M. V.	6.747 .234 8.068 .154	7.1 .15 7.7 .30	6.9 .07 6.9 .33	6.8 .14 6.5 .27	6.9 .17 6.7 .13	6.7 .14 7.0 .37	6.3 .38 6.9 .21	11.4 .62 10.0 .36	6.8 .12 7.4 .35	7.1 .23 6.9 .17	6.8 .11 7.1 .22	6.8 .11 7.4 .18	6.6 .12 7.0 .26	6.4 .28 7.1 .37	6.7 .27 4.8 .43
		See,	saw,	Margery	Daw;	Johnny shall	have a new	master.	He shall	have but a	penny a	day be-	cause he can't	work any	faster.
S. M. V. T. M. V.	8.142 .342 7.785 .278	7.7 .43 7.9 .34	7.5 .25 7.2 .36	7.3 .36 7.4 .30	7.1 .31 6.5 .32	6.7 .32 6.8 .27	6.4 .34 6.8 .32	14.1 .38 12.7 .64	6.3 .21 6.7 .14	6.4 .30 6.7 .23	6.3 .24 6.3 .22	6.3 .21 6.0 .29	6.0 .26 7.1 .32	6.5 .21 6.4 .18	5.2 .21 5.0 .39
		If	all the	world were	apple	pie, And	all the	ink, And	all the	trees were	bread and	cheese, What	should we	do for	drink?
S. M. V. T. M. V.	6.073 .159 6.983 .133	7.1 .24 7.4 .33	6.9 .27 7.2 .27	6.6 .35 6.9 .16	6.8 .29 6.9 .22	6.8 .20 6.5 .27	6.5 .21 6.8 .34	13.4 .78 11.3 .60	6.9 .28 7.2 .30	6.6 .19 7.1 .20	6.7 .31 6.5 .31	6.8 .38 7.1 .17	6.4 .30 6.6 .24	5.7 .26 6.6 .40	6.2 .34 5.3 .51
Averages of the percentage val- ues of the inter- vals.	†S. 7.33 T. 7.92	7.15	6.85	6.98	6.75	6.40	12.88 11.06	6.88	6.70	6.68	6.65	6.45	6.13 6.68	5.53 4.46	

\* Old King Cole, average of 10 repetitions for S, and 9 for T.

† Hey! diddle, diddle, average of 7 repetitions for S, and 8 for T.

‡ Average of four rhymes only. "Mistress Mary" being omitted because of the defect of the last syllables.

TABLE II. Part iii.

Giving the average total times in seconds required for the recitation of the SHORT MEYER pattern together with the relative values of the intervals expressed as average percentages of the total time.

	Av. total time.	Hickory,	dickey,	dock,	The mouse ran	up the clock,	The clock struck	one the mouse ran	down.	Hickory,	dickey,	dock.
S. *	5.012	7.8	7.4	11.1	6.8	7.3	11.9	7.2	7.0	6.9	6.8	4.7
M. V.	.199	.57	.29	.56	.37	.34	.66	.40	.32	.33	.22	.43
T.	5.844	7.6	7.7	9.0	7.6	7.3	8.4	7.9	8.0	7.4	7.4	5.3
M. V.	.200	.50	.25	.33	.47	.33	.27	.28	.25	.20	.21	.27

\* Based on 6 repetitions for S.

TABLE II. Part iv.

The table gives the relative values of the intervals for the rhyme "Intery, mintery," (a three couplet rhyme of 4-stress lines) expressed as average percentages of the total times.

Average total time: S. 12.971, M. V. 0.205; T. 13.408, M. V. 0.200.

	Intery,	mintery,	cutery,	corn,	Apple	seed and	apple	thorn.
S.	4.5	4.3	4.2	4.6	4.1	4.2	4.1	4.5
T.	.10	.10	.19	.17	.12	.11	.12	.19
	4.6	4.2	4.1	4.5	4.3	3.9	4.1	4.4
	.19	.14	.13	.15	.15	.19	.19	.19
	Wire,	brier,	limber,	lock;	Three	geese	in a	flock.
S.	4.3	4.3	4.1	4.0	4.3	4.3	3.9	4.1
T.	.11	.19	.09	.13	.21	.06	.21	.16
	4.3	4.4	4.0	4.1	4.3	3.9	4.0	4.2
	.16	.34	.11	.19	.22	.24	.26	.23
	Sit and	sing	by a	spring,	O. U.	T. and	in a-	gain.
S.	4.5	4.2	4.0	4.7	4.0	4.2	3.7	2.8
T.	.19	.12	.10	.11	.16	.18	.14	.22
	4.5	4.3	4.0	4.4	4.4	3.9	3.8	2.7
	.22	.23	.09	.16	.11	.15	.16	.24

TABLE II. Part v.

Giving in approximate thousandths of a second the values of intervals when the three most common stanza patterns are executed in bare taps. Timed with a tuning fork giving 99 v. d. per second.

#### Long Meter Pattern.

S.	295	314	324	330	270	282	300	315	284	282	295	314	276	293	273
"	315	305	270	330	300	285	314	340	263	285	332	280	280	285	—
T.	330	315	297	332	305	297	296	310	290	283	300	320	283	282	290
"	305	304	282	307	275	304	295	318	304	295	287	317	292	290	308

#### Common Meter Pattern.

S.	272	298	282	310	272	290	—	280	275	270	274	275	280	—
"	290	305	270	283	290	282	—	270	270	290	277	260	290	—
"	317	285	260	300	268	262	—	268	270	265	295	252	252	—
T.	—	—	—	—	—	—	—	310	320	304	324	303	310	495
"	323	305	295	335	310	302	520	290	295	305	300	300	305	540
	312	301	295	310	300	288	545	310	293	293	327	332	290	583

#### Short Meter Pattern.

S.	285	298	496	280	298	475	275	274	246	280	266	280	—
"	292	290	475	270	275	472	253	283	255	285	255	280	—
T.	310	340	520	340	300	500	310	317	282	292	290	290	520
"	315	310	550	300	290	505	287	307	284	300	275	305	557

NOTE.—The blanks at the end of the records of S indicate that he paused a considerable time after the completion of the pattern, while T continued; the blanks in the middle of the common meter pattern, also indicate long pauses not counted. The tapping seems to have been executed by grouping sevens, rather than as a unitary stanza pattern.

paign of 1884 this pattern was used with the words "Blaine, Blaine, James G. Blaine" and a stamping accompaniment, an idea which Charles Ledyard Norton<sup>1</sup> says can be traced back to the Columbia College students. The same pattern has been observed in use by children as a march rhythm: January, February, March, March, March. The most striking difference, however, is the greater prominence of patterns involving 3-stress groups. These occur of course as constituent parts of both yells and nursery rhymes in the common and short meter patterns, but also among the yells in about eight out of nine of the remaining cases.

These college yells are the settled choice of the students of the various institutions to which they pertain, and in many cases are decided upon by vote of the student body. The proportions found may therefore be correctly considered as the rhythmic preferences of American college students for the purpose for which they are used. It is difficult to state the causes inspiring this choice. It is not to be taken for granted that the preferences of college men for rhythms will be in exact proportion to the size of the groups in such a list of favorite nursery rhymes as that considered in the previous section. Aside from other influences, it is quite possible that the impression left by the rhymes in the short meter pattern may be more lasting than that left by the larger groups of other sorts. A motion rhythm like that of "Peas porridge hot," which all children like to play, would probably have considerable advantage in this respect. It is more probable, however, that the fact noted indicates that some rhythms are better suited for certain purposes than for others, and that the choice of the tripodic form so prominent in the yells rests upon other and perhaps physiological reasons. Three explosive sounds can be uttered with more ease and satisfaction—for respiratory reasons probably—than a greater number (it is a common saying of those who invent yells that the test of excellence is to try them), and with more telling effect than a less number. In cheering, also, the abruptness of the sound is an important factor. A yell without marked pauses cannot possibly be so effective as one in which the pulses of sound are more sharply marked off from one another. An example will perhaps make this clear. The following yell, even when given by practiced voices, merges into a mere bellow of sound: Gloriana, Frangipanna, Indiana! Kazoo, Kazah! Kazoo, Kazah! Hoop Lah! Hoop Lah! State University, Rah! Rah! Rah! One of the more effective type in use in the University of California is—Rah, Rah, Rah, Califor-ni-a, U. C. Berk'lee, Zip, Boom, Ah! In so far as the first lacks in ex-

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<sup>1</sup> Charles Ledyard Norton : *Political Americanisms*, p. 120.

plosive abruptness of rhythm, it loses in stirring effect. The abruptness will of course depend largely on the syllables that compose the yell, but, as appears from the tables given in the preceding section, the short meter pattern has an advantage over the others in having unmistakable pauses at the ends of the first two of its 3-stress lines.

It would be interesting if it were possible to trace the history of cheering. Antedating all college yells, so-called, we have the conventional form of it, which is known as "giving three cheers" or giving "three times three" for a person. This custom was observed at least as far back as the last century, and probably much earlier.<sup>1</sup> It is undoubtedly from this that the original nine rah yells of Yale and Harvard are derived. The question of, why *three* cheers is left unsettled by us with only a conjecture that long ages of practical experience developed this rhythmic form of sounds as the most satisfying and effective.

#### IV. SOME COMMON RHYTHMS AND THE WORDS THAT HAVE BEEN FITTED TO THEM.

The tendency of imaginative hearers to give a meaning and a verbal clothing to rhythmic sounds of any sort is everywhere in evidence, especially where there is the perception of conformity of the rhythm to one of the familiar metric patterns. Every one can recall instances. The telephone call of a veterinary surgeon is translated by another person on the same circuit into the perfect iambic line "my horse is sick; come quick, come quick." The rising bell in a large woman's college says to one "crawl out, crawl out, crawl out," and for meals "come in, come in, come in." To another it says "get up, get up, get up," and "quick quick, quick quick, quick quick," respectively. One person was told as a child that the schoolbell said "Helen, come to school," and has heard those words ever since when it rings. The dinner bell is reported by a masculine observer to say, "you hungry cusses, come in, come in; you hungry cusses, come in, come in."

Perhaps the most familiar instance is the interpretation of the ringing of church bells—a very different interpretation, however, in the case of the faithful churchgoer and in that given by the profane sluggard whose rest is thereby disturbed. This general trait has been elaborately worked out in a poem formerly much affected by elocutionists, beginning:

"How sweet the chime of Sabbath bells,  
Each one its creed in music tells."

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<sup>1</sup> Scots Magazine, in 1789, p. 356.

Each creed in successive stanzas receives its characterization in the language of the bell. Perhaps two instances will suffice:

"Farewell, farewell, base world farewell,  
Say to the world farewell, farewell,  
Pealed forth the Presbyterian bell."

"In after life there is no hell,  
No hell, no hell, no hell, no hell,  
Rang out the Universalist bell."

The railroad and steamer furnish an almost inexhaustible supply of meters and rhythms. Engineers of imaginative temperament listening to the voices of their engines endow them with the attributes of a distinct personality, and the traveller by steamer may hear in the throb of the screw: "Got yer trunk, got yer trunk, got yer trunk." Musicians find in such sounds suggestions for motifs as Leonardo found those for pictures in the mottled surfaces of tables. Berlioz is said to have derived the motive for the "Ride to Hell" in the "Damnation of Faust" from the clattering of an express train during a sleepless night. What shall be the meaning given to these rhythms depends on the emotional tone of the hearer. To one young romancer it is the machine spirit repeating with variations the words "Oh hurry up, oh hurry up, oh hurry up." To one who has been bereaved by its agency it is the threatening voice of a cruel monster. Kipling's ".007" covers "his one hundred and fifty-six miles in two hundred and twenty-one minutes"—"a hundred feet to each word."

"With a michnai—ghignai—shtingal! Yah! Yah! Yah!  
Ein—zwei—drei—mutter! Yah! Yah! Yah!  
She climb upon der shteeple  
Und she frighten all the people  
Singin' michnai—ghignai—shtingal! Yah, Yah."

To one listener the ticking of an alarm clock calls up the Lady of the Lake. The patter of rain, the crunching of frozen snow, and even the rhythm of ordinary walking bring a verbal accompaniment to the minds of some. This tendency has long been exploited by the humorist in the croaking of bullfrogs and the hooting of owls. Bird lovers interpret the notes of their favorites. The robin says "Cheer up, cheer up," the white-throated sparrow "See me! Peabody, peabody, peabody." The crowing of the cock to one means "Who the devil cares." To spur his flagging energy a farmer's boy was told that the meadow lark sings "Laziness will kill you," and has continued to hear these words in its song. To others they mean "My poor children."

The various metric patterns presented in the military bugle calls have furnished the best illustrations of the trait under

discussion. During the Civil and Spanish wars the following words were fitted to them:<sup>1</sup>

## 14. REVEILLE.



I can't get 'em up,  
 I can't get 'em up,  
 I can't get 'em up in the morning.  
 I can't get 'em up,  
 I can't get 'em up,  
 I can't get 'em up at all.

The captain's worse than the sergeant,  
 The sergeant's worse than the corporal,  
 The corporal's worse than the private,  
 But the major's the worst of all.

[Then repeat first part.]



Come, come to the stable  
 All ye who are able,  
 Water your horses and get them some hay,

<sup>1</sup> For the electrotypes of the musical scores we are indebted to the courtesy of D. Appleton & Co., New York.

For if you don't do it  
The colonel will know it,  
And ho ! for the guard house  
The very next day.

## 18. MESS.



Soupy, soupy, soup, soup,  
Without a single bean ;  
Porky, porky, pork, pork,  
Without a streak of lean ;  
Coffee, coffee, coffee,  
The vilest ever seen.

## 17. TAPS.



[The signal for lights out.]

Put it out, put it out, put it out, etc.

The words soldiers have put to this call when used in the burial services are:

“ Love, good night, must thou go,  
When the day and the night need thee so?  
All is well.  
Hasten all to their rest.”

In the ordinary setting of words to music great liberty is taken with the quantity of the syllables used. In the present instances where words have been *fitted* to the music a more exact congruity may be expected, and the question may naturally be asked whether the notes represent with fair accuracy the true quantities of the syllables in question. This seems rather doubtful, especially in the case of the unstressed syllables. The cases are interesting, however, as showing the same rhythmic patterns fashioned from two sorts of rhythmic material.